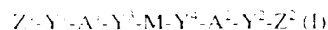


97-087094/08 A41 E19 G03 I 03 BADI 95.09.01
BASE AG *WO 9700600-A2
95.09.01 95DE-1032408 (97.07.09) COSL C09K 19.00
Polymerisable liq. crystal cpds. for optical displays, cholesteric dyes or photocurable adhesives - prepd. by reacting chloroformate cpds. with mesogenic diol(s) (Eng)
C97-028282 N(CA JP KR US) R(AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE)
Addnl. Data: MEYER F, SIEMENSMEYER K, ETZBACH K, SCHUHMACHER P
96.08.26 96WO-EP03756

Polymerisable liq. crystals cpds. of formula



A¹, A² = 2-30C spacer, opt. contg. (thio)ether functional S or O atoms, or non-adjacent (1-4C alkyl)amino gps., in the C chain;

M = mesogenic gps.;

R = 1-4C alkyl;

Y¹, Y² = single bond, O, S, -O-CO-, -CO-O-, -O-CO-O-, -CO-NR-, -NR-CO-, -O-CO-NR-, -NR-CO-O- or -NR-CO-NR-, with the provision that at least one of gps. Y³ and Y⁴ is -O-CO-O-, -O-CO-NR-

A(8-E1, 9-A2A, 12-L3B) E(10-A11B2, 10-A12C2, 10-B4, 10-G2) G(3-B1, 3-B2, 4-B) L(3-D1D1)

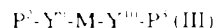
-NR-CO-O- or -NR-CO-NR-; and
Z¹, Z² = substituents contg. reactive gps. allowing polymerisation to take place,
are new.

Also claimed are the following:

(i) liq. crystal compsn. (L1) contg. ≥1 cpd. (I) and opt. ≥1 cpd. of formula



and/or



A¹ = A²,
P¹-P¹ = H, 1-30C alkyl, 1-30C acyl or 2-8C cycloalkyl, opt. mono- di- or trisubstid. by 1-6C alkyl gps., and which may contain (thio)ether functional S or O atoms, or non-adjacent (1-4C alkyl)amino gps., in the C chain;

Y⁶, Y¹⁰ = Y¹, with the same provision applying to Y⁷/Y⁸ and Y⁹/Y¹⁰ as Y³ and Y⁴;

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Z¹ = Z²;

(ii) cpds. of formula (II);

(iii) liq. crystal compsns. (L2) contg. ≥1 cpd. (I)-(III) and ≥1 chiral cpd.;

(iv) liq. crystal compsns. (L3) comprising 10-100 wt.% (I)-(III), 0-90 wt.% other monomers and 0-50 wt.% of ≥1 chiral cpd. all w.r.t. (L3);

(v) the prepn. of (I) in which Y³ and Y⁴ are -O-CO-O- gps., or mixts. of (I);

(vi) the prepn. of (II) in which Y³ and Y⁴ are -O-CO-O- gps., or mixts. of (II);

(vii) the prepn. of liq. crystal coatings by applying ≥1 cpd. (I), or compsns. (L2), and opt. other polymerisable cpds. and chiral cpds. onto a substrate, setting up a liq. orientation by standard techniques and then polymerising the cpds. applied onto the substrate;

(viii) coated articles prepd. by the method described in (vii);

(ix) cholesteric liq. crystal dyes contg. (L2) or (L3);

(x) pigments prepd. by polymerising (L2) or (L3) and then crushing the polymer into pigment particles.

USE

(I), (II) and (L1)-(L3) are used to make optical display devices, whilst (L2) and (L3) are useful as cholesteric liq. crystal dyes

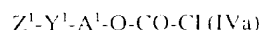
(claimed). The cpds. can also be used as polymerisable matrix components for polymer-dispersed displays or photocurable liq. crystal-based adhesives.

ADVANTAGE

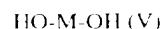
A combination of low liq. crystalline phase temps., wide liq. crystalline temp. ranges and high mechanical strength is achieved.

CLAIMED PREPARATION

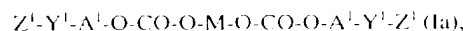
(I) are prepd. by reacting one or more cpds. of formula



with one or more mesogenic diols



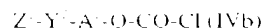
to form symmetrical cpds.



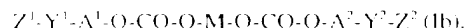
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or (V) is reacted with (IVa) in a first step and with



in a second step to form an asymmetric cpd.

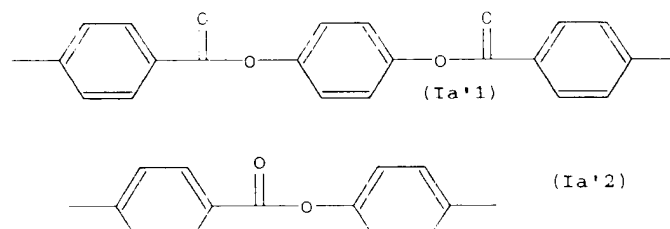


(Ib) are prepd. by reacting a chloroformate

in a third step,

PREPARED COMPOUNDS

A¹, A² = one of Y¹ and Y² is an -O-CO-O- gps. -M- is one of



wherein M further contains 0-2 substituents chosen from 1-20C alkyl, 1-

200° alkoxy-carbonyl, 1-200° mono-alkylaminocarbonyl, 1-200° alkylcarbonyloxy, 1-200° alkylcarbonylamino, formyl, halogen CN, OH or NO₂.

T = divalent iso- or heterocyclic gp.

Y¹ = Y², O-CH₂-O, CH₂-O, CH=N, N=CH or N=N; and r = 0-3.

The gps. in parts A/A', Y¹/Y², Y³/Y⁴ and Z/Z' are the same.

PREFERRED COMPOSITION

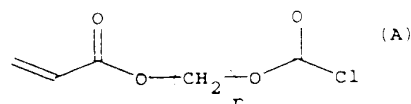
(I,2) contain 1-98 mol.% (I), 1-98 mol.% (II), and 0.01-90 mol.% (III) and comprise 60-99.999 wt.% (I)-(II) and 0.001-40 wt.% chiral epds. in w.r.t. the compsn.

PREFERRED PREPARATION

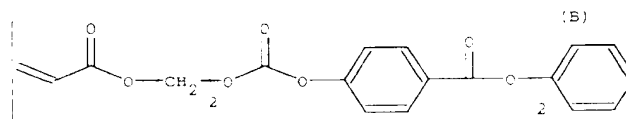
The reaction is carried out in the presence of an (inorganic base.

EXAMPLE

A soln. of 5 mmols. 1,4-bis(4'-hydroxybenzyl)-benzoyloxy-benzene (mesogenic diol) and 20 ml pyridine was added at 0°C to a soln. in ml CH₂Cl₂ of 12 mmols chloroformate having the following formula (A).



The reaction mixt. was stirred for 3 h. at room temp., then dil. HCl was added to ppt. the prod. and this was filtered off, washed and purified by recrystallisation. The liq. crystalline temp. range was 124-162°C and its formula was (B).



(KB)
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